Amendments to the Claims

Claim 1 **(Currently Amended)** A device comprising:

a sensor platform having a planar optical waveguide;

a sealing layer forming, either directly or with a sealing medium, a tight seal with said planar optical waveguide; and

a plurality of recesses opening at least towards said sensor platform, which form a corresponding plurality of sample compartments, said plurality of sample compartments being arranged with at least two sample compartments in a length direction and at least two sample compartments in a width direction ~~in a two-dimensional arrangement~~, wherein

each of said sample compartments has different biological or biochemical recognition elements for specific recognition and binding of different analytes immobilized in five or more discrete measurement areas ~~in a two-dimensional array~~ on said planar optical waveguide, said measurement areas being arranged with at least two measurement areas in a length direction and at least two measurement areas in a width direction,

said measurement areas are in optical interaction with excitation light emanating from said optical waveguide, as part of said sensor platform which forms a demarcation of said sample compartments, and

said sample compartments are operable to have ~~such that~~ sample or reagent solutions received therein cleared ~~are clearable~~ therefrom and to have further sample or reagent solutions ~~are able to be~~ supplied thereto.

Claim 2 **(Previously Presented)** A device according to claim 1, wherein at least one of said measurement areas in each of said sample compartments is for referencing.

Claim 3 **(Previously Presented)** A device according to claim 2, wherein said referencing measurement areas reference same chemical or optical parameters in a number of said sample compartments distributed over said sensor platform, whereby a lateral distribution of the chemical or optical parameters over said sensor platform is determined.

Claim 4 **(Previously Presented)** A device according to claim 1, wherein said measurement areas are in optical interaction with an evanescent field of the excitation light guided in said planar optical waveguide.

Claim 5 **(Previously Presented)** A device according to claim 1, wherein said planar optical waveguide is a multi-mode or single-mode waveguide comprising an anorganic material or an organic material that is optically transparent at least at an excitation wavelength and a luminescence wavelength.

Claim 6 **(Previously Presented)** A device according to claim 1, wherein said planar optical waveguide is self-supporting.

Claim 7 **(Previously Presented)** A device according to claim 1, wherein said planer optical waveguide is an optical film waveguide having a first optically transparent layer and a second optically transparent layer, said first optically transparent layer being on said second optically transparent layer and said second optically transparent layer having a lower refractive index than said first optically transparent layer.

Claim 8 **(Previously Presented)** A device according to claim 7, wherein said second optically transparent layer comprises glass, quartz, or transparent thermoplastic plastics.

Claim 9 **(Previously Presented)** A device according to claim 7, wherein the refractive index of said first optically transparent layer is higher than 1.8.

Claim 10 **(Previously Presented)** A device according to claim 7, wherein said first optically transparent layer comprises TiO_2, ZnO, Nb_2O_5, Ta_2O_5, HfO_2, or ZrO_2.

Claim 11 **(Previously Presented)** A device according to claim 7, wherein a thickness of said first optically transparent layer is between 40 and 300 nm.

Claim 12 **(Previously Presented)** A device according to claim 7, wherein said optical film waveguide further has an additional optically transparent layer in contact with said first optically transparent layer and having a lower refractive index than said first optically transparent layer, said additional optically transparent layer having a thickness of 5 nm - 10,000 nm and being located between said first and second optically transparent layers.

Claim 13 **(Previously Presented)** A device according to claim 12, wherein said additional optically transparent layer reduces surface roughness below said first optically transparent layer, reduces penetration of an evanescent field, of light guided in said first optically transparent layer, into one or more layers located below said first optically transparent layer, improves adhesion of said first optically transparent layer to the one or more layers located below said first optically transparent layer, reduces thermally induced stress within said sensor platform, or provides chemical isolation of said first optically transparent layer from layers located below, by sealing of micro pores in said first optically transparent layer against the layers located below.

Claim 14 **(Previously Presented)** A device according to claim 7, further comprising an adhesion-promoting layer deposited on said first optically transparent layer for immobilizing biological, biochemical or synthetic recognition elements.

Claim 15 **(Previously Presented)** A device according to claim 14, wherein said adhesion-promoting layer has a thickness of less than 200 nm.

Claim 16 **(Previously Presented)** A device according to claim 14, wherein said adhesion-promoting layer comprises chemical compounds of a group consisting of silanes, epoxides, and "self-organized functionalized monolayers".

Claim 17 **(Previously Presented)** A device according to claim 1, wherein said measurement areas are generated by deposition of biological, biochemical or synthetic recognition elements on said sensor platform.

Claim 18 **(Previously Presented)** A device according to claim 17, wherein said measurement areas are deposited by one or more methods of a group consisting of ink jet spotting, mechanical spotting by means of pin or pen, micro contact printing, fluidic contacting of said measurement areas with the biological, biochemical or synthetic recognition elements upon their supply in parallel or crossed micro channels, upon application of pressure differences or of electric or electromagnetic potentials.

Claim 19 **(Previously Presented)** A device according to claim 17, wherein, as the biological, biochemical or synthetic recognition elements, components of a group consisting of nucleic acids, antibodies, aptamers, membrane-bound and isolated receptors, ligands of the membrane-bound and isolated receptors, antigens for antibodies, histidin-tag components, cavities generated by chemical synthesis, for hosting molecular imprints, are deposited.

Claim 20 **(Previously Presented)** A device according to claim 17, wherein whole cells or cell fragments are deposited as the biological, biochemical or synthetic recognition elements.

Claim 21 **(Previously Presented)** A device according to claim 17, wherein compounds, which are "chemically neutral" towards the analytes, are deposited between said measurement areas, in order to minimize nonspecific binding or adsorption.

Claim 22 **(Previously Presented)** A device according to claim 21, wherein the compounds, which are chemically neutral towards the analyte, are albumines, herring sperm, or polyethyleneglycols.

Claim 23 **(Previously Presented)** A device according to claim 7, wherein said first optically transparent layer has at least one grating structure formed therein for incoupling excitation light to said measurement areas.

Claim 24 **(Previously Presented)** A device according to claim 7, wherein said first optically transparent layer has at least one grating structure formed therein for outcoupling light guided in said first optically transparent layer.

Claim 25 **(Previously Presented)** A device according to claim 23, wherein said first optically transparent layer also has at least one grating structure formed therein for outcoupling light guided in said first optically transparent layer.

Claim 26 **(Previously Presented)** A device according to claim 25, wherein said incoupling and outcoupling grating structures are interchangeable with respect to incoupling and outcoupling.

Claim 27 **(Previously Presented)** A device according to claim 25, wherein said incoupling and outcoupling grating structures have a period of 200 nm - 1000 nm and a grating modulation depth of 3 nm - 100 nm.

Claim 28 **(Previously Presented)** A device according to claim 27, wherein a ratio of the grating modulation depth to a thickness of said first optically transparent layer is equal or smaller than 0.2.

Claim 29 **(Previously Presented)** A device according to claim 23, wherein said grating structure is also for outcoupling, said grating structure being (a) a relief grating with a rectangular, triangular or semi-circular profile or (b) a phase or volume grating with a periodic modulation of a refractive index in said first optically transparent layer.

Claim 30 **(Previously Presented)** A device according to claim 7, further comprising a thin metal layer deposited between said first optically transparent layer and the immobilized biological or biochemical recognition elements, wherein a thickness of said thin metal layer is such that a surface plasmon at at least one of an excitation wavelength and a luminescence wavelength is excitable.

Claim 31 **(Previously Presented)** A device according to claim 23, wherein said grating structure is also for outcoupling, said grating structure being a diffractive grating with a uniform period.

Claim 32 **(Previously Presented)** A device according to claim 23, wherein said grating structure is a multi-diffractive grating.

Claim 33 **(Previously Presented)** A device according to claim 25, wherein said incoupling and outcoupling grating structures are located outside a region of said sample compartments.

Claim 34 **(Previously Presented)** A device according to claim 25, wherein said incoupling and outcoupling grating structures extend over at least a portion of said sample compartments.

Claim 35 **(Previously Presented)** A device according to claim 23, wherein a portion of said sealing layer is optically transparent both for excitation radiation and excited luminescence radiation at least within a penetration depth of an evanescent field.

Claim 36 **(Previously Presented)** A device according to claim 35, wherein said sealing layer comprises a first layer that is in contact with a surface of said sensor platform, said first layer being transparent for the excitation radiation and the excited luminescence radiation, and a second layer that is located remote from said sensor platform, said second layer being absorbent in a spectral range of the excitation radiation and of the excited luminescence radiation.

Claim 37 **(Previously Presented)** A device according to claim 34, wherein said sealing layer is absorbent in a spectral range of excitation radiation and excited luminescence radiation.

Claim 38 **(Previously Presented)** A device according to claim 1, wherein said sealing layer is self-adhesive.

Claim 39 **(Previously Presented)** A device according to claim 1, wherein said sealing layer comprises a polysiloxane.

Claim 40 **(Previously Presented)** A device according to claim 1, wherein 5 - 1000 of said measurement areas are located in one of said sample compartments.

Claim 41 **(Previously Presented)** A device according to claim 1, wherein an individual one of said measurement areas in said sample compartments occupies an area of 0.001 - 6 mm^2, and wherein different measurement areas have similar or different sizes.

Claim 42 **(Previously Presented)** A device according to claim 1, wherein each of said sample compartments has a volume of 100 nl - 1 ml.

Claim 43 **(Previously Presented)** A device according to claim 1, wherein said sample compartments are closed at a side facing away from said sensor platform except for inlet and outlet openings for supply and removal, respectively, of samples, wherein the supply and removal of the samples is performed in a closed flow-through system, and wherein when liquid is supplied to said measurement areas or segments with common inlet and outlet openings, said inlet and outlet openings are addressed row by row or column by column.

Claim 44 **(Previously Presented)** A device according to claim 1, wherein the supply of the samples is performed in parallel or crossed micro channels, affected by pressure differences or by electric or electromagnetic potentials.

Claim 45 **(Previously Presented)** A device according to claim 1, wherein said sample compartments have openings for locally addressed supply or removal of samples or other reagents at a side facing away from said sensor platform.

Claim 46 **(Previously Presented)** A device according to claim 1, wherein compartments are provided for reagents, which are wetted and brought into contact with said measurement areas during an assay.

Claim 47 **(Previously Presented)** A device according to claim 1, wherein said sensor platform has optically or mechanically recognizable marks provided thereon, the optically or mechanically recognizable marks at least one of facilitating adjustment of said sensor platform in an optical system and facilitating combination of said sensor platform with said sealing layer having said recesses for said sample compartments.

Claim 48 **(Withdrawn)** An analytical system for the determination of one or more luminescences, the analytical system comprising:

at least one excitation light source;

a device according to claim 1; and

at least one detector for recording emission light emanating from at least one of said measurement areas on said sensor platform.

Claim 49 **(Withdrawn)** An analytical system according to claim 48, wherein said planar optical waveguide is an optical film waveguide having a first optically transparent layer and a second optically transparent layer, said first optically transparent layer being on said second optically transparent layer and said second optically transparent layer having a lower refractive index than said first optically transparent layer, and wherein the excitation light emitted by said at least one excitation light source is coherent and directed onto one or more of said measurement areas at a resonance angle for incoupling into said first optically transparent layer.

Claim 50 **(Withdrawn)** An analytical system according to claim 49, further comprising expansion optics, wherein said expansion optics expand the excitation light of said at least one light source to an essentially parallel ray bundle and direct the essentially parallel ray bundle onto said one or more measurement areas at the resonance angle for incoupling into said first optically transparent layer.

Claim 51 **(Withdrawn)** An analytical system according to claim 49, further comprising at least one diffractive optical element, wherein said at least one diffractive optical element divides the excitation light from said at least one light source into a multitude of individual beams having similar intensities, the individual beams being directed essentially in parallel to each other onto laterally separated measurement areas.

Claim 52 **(Withdrawn)** An analytical system according to claim 49, wherein said at least one excitation light source is at least two coherent light sources.

Claim 53 **(Withdrawn)** An analytical system according to claim 48, wherein said at least one detector is a laterally resolving detector.

Claim 54 **(Withdrawn)** An analytical system according to claim 53, wherein said laterally resolving detector is a CCD camera, a CCD chip, a photodiode array, an Avalanche diode array, a multi-channel plate, or a multi-channel photomultiplier.

Claim 55 **(Withdrawn)** An analytical system according to claim 48, further comprising optical components located at least one of between said excitation light source and said detector and said sensor platform and said detector, said optical components including at least two of (a) lenses or lens systems for shaping of transmitted light bundles, (b) planar or curved mirrors for deviation of the transmitted light bundles, (c) prisms for deviation and optionally spectral separation of the transmitted light bundles, (d) dichroic mirrors for spectrally selective deviation of parts of the transmitted light bundles, (e) neutral density filters for regulation of transmitted light intensity, (f) optical filters or monochromators for spectrally selective transmission of parts of the transmitted light bundles, and (g) polarization selective elements for selection of discrete polarization directions of the excitation light or luminescence light.

Claim 56 **(Withdrawn)** An analytical system according to claim 48, wherein said excitation light source emits the excitation light in pulses with a duration of 1 fsec to 10 min.

Claim 57 **(Withdrawn)** An analytical system according to claim 48, wherein the emission light from said at least one measurement area is measured time-resolved.

Claim 58 **(Withdrawn)** An analytical system according to claim 48, wherein light signals of the excitation light at a location of said excitation light source, the excitation light after expansion, the excitation light after its multiplexing into individual beams, scattered light at an excitation wavelength from a location of one or more laterally separated measurement areas, or light of the excitation wavelength outcoupled by a grating structure are measured for reference.

Claim 59 **(Withdrawn)** An analytical system according to claim 58, wherein said measurement areas for determination of the emission light and of the reference light signals are identical.

Claim 60 **(Withdrawn)** An analytical system according to claim 48, wherein launching of the excitation light and detection of the emission light from said at least one measurement area is performed sequentially for one or more of said sample compartments.

Claim 61 **(Withdrawn)** An analytical system according to claim 60, further comprising movable optical components for performing the sequential excitation and detection, said movable optical components including at least two of mirrors, deviating prisms, and dichroic mirrors.

Claim 62 **(Withdrawn)** An analytical system according to claim 61, further comprising an essentially focus and angle preserving scanner for performing the sequential excitation and detection.

Claim 63 **(Withdrawn)** An analytical system according to claim 60, wherein said sensor platform is moved between steps of sequential excitation and detection.

Claims 64-80 **(Canceled)**

Claim 81 **(Previously Presented)** A device according to claim 7, wherein said measurement areas are generated by deposition of biological, biochemical or synthetic recognition elements on said sensor platform.

Claim 82 **(Previously Presented)** A device according to claim 7, wherein said sealing layer is self-adhesive.

Claim 83 **(Previously Presented)** A device according to claim 7, wherein said sealing layer comprises a polysiloxane.

Claim 84 **(Previously Presented)** A device according to claim 7, wherein 5 - 1000 of said measurement areas are located in one of said sample compartments.

Claim 85 **(Previously Presented)** A device according to claim 7, wherein an individual one of said measurement areas in said sample compartments occupies an area of 0.001 - 6 mm^2, and wherein different measurement areas have similar or different sizes.

Claim 86 **(Previously Presented)** A device according to claim 7, wherein each of said sample compartments has a volume of 100 nl - 1 ml.

Claim 87 **(Previously Presented)** A device according to claim 7, wherein said sample compartments are closed at a side facing away from said first optically transparent layer except for inlet and outlet openings for supply and removal, respectively, of samples, wherein the supply and removal of the samples is performed in a closed flow-through system, and wherein a liquid is supplied to said measurement areas or segments with common inlet and outlet openings, said inlet and outlet openings being addressed row by row or column by column.

Claim 88 **(Previously Presented)** A device according to claim 7, wherein the supply of the samples is performed in parallel or crossed micro channels, affected by pressure differences or by electric or electromagnetic potentials.

Claim 89 **(Previously Presented)** A device according to claim 7, wherein said sample compartments have openings for locally addressed supply or removal of samples or other reagents at a side facing away from said first optically transparent layer.

Claim 90 **(Previously Presented)** A device according to claim 7, wherein compartments are provided for reagents, which are wetted and brought into contact with said measurement areas during an assay.

Claim 91 **(Previously Presented)** A device according to claim 7, wherein said sensor platform has optically or mechanically recognizable marks provided thereon, the optically or mechanically

recognizable marks at least one of facilitating adjustment of said sensor platform in an optical system and facilitating combination of said sensor platform with said sealing layer having said recesses for said sample compartments.

Claim 92 **(Withdrawn)** An analytical system for determining one or more luminescences, the analytical system comprising:

at least one excitation light source;

a device according to claim 7; and

at least one detector for recording emission light emanating from at least one of said measurement areas on said sensor platform.